

SEQUENCE LISTING

<110> FIEBIG, HELMUT
NANDY, ANDREAS
CROMWELL, OLIVER

<120> DNA SEQUENCE, AND RECOMBINANT PREPARATION OF GROUP 4
MAJOR ALLERGENS FROM CEREALS

<130> MERCK-3178

<140> 10/583,089

<141> 2006-06-15

<150> PCT/EP04/013664

<151> 2004-12-01

<150> DE 10359351.9

<151> 2003-12-16

<160> 44

<170> PatentIn Ver. 3.3

<210> 1

<211> 1603

<212> DNA

<213> Secale cereale

<220>

<221> CDS

<222> (1)..(1557)

<400> 1

aac tat agg gcc ttc gcg ctg gcg ctc ctc ttc tgc gcc ttg tcc tgc	48
Asn Tyr Arg Ala Phe Ala Leu Ala Leu Leu Phe Cys Ala Leu Ser Cys	
1 5 10 15	
caa gcc gcc gcg gcc gcc tac gcg ccc gtg cct gcc aag gcg gac ttc	96
Gln Ala Ala Ala Ala Ala Tyr Ala Pro Val Pro Ala Lys Ala Asp Phe	
20 25 30	
ctc gga tgc ctc atg aag gag ata ccg gcc cgc ctc ctc tac gcc aag	144
Leu Gly Cys Leu Met Lys Glu Ile Pro Ala Arg Leu Leu Tyr Ala Lys	
35 40 45	
agc tcg cct gac tac ccc acc gtg ctg gcg cag acc atc agg aac tcg	192
Ser Ser Pro Asp Tyr Pro Thr Val Leu Ala Gln Thr Ile Arg Asn Ser	
50 55 60	
cgg tgg tcg tcg ccg cag aac gtg aag ccg atc tac atc atc acc ccc	240
Arg Trp Ser Ser Pro Gln Asn Val Lys Pro Ile Tyr Ile Ile Thr Pro	
65 70 75 80	
acc aac gcc tcg cac atc cag tcc gcg gtg gtg tgc ggc cgc cgg cac	288
Thr Asn Ala Ser His Ile Gln Ser Ala Val Val Cys Gly Arg Arg His	
85 90 95	

ggc atc cgc ctc cgc gtg cgg agc ggc ggc cac gac tac gag ggc ctg	336
Gly Ile Arg Leu Arg Val Arg Ser Gly Gly His Asp Tyr Glu Gly Leu	
100 105 110	
tcg tac cgg tct gag aaa ccc gag acg ttc gcc gtc gtc gac ctc aac	384
Ser Tyr Arg Ser Glu Lys Pro Glu Thr Phe Ala Val Val Asp Leu Asn	
115 120 125	
aag atg cgg gca gtg tcg gtc gac ggc tac gcc cgc acg gcg tgg gtc	432
Lys Met Arg Ala Val Ser Val Asp Gly Tyr Ala Arg Thr Ala Trp Val	
130 135 140	
gaa tcc ggc gcg cag ctc ggc gag ctc tac tac gcg atc gcc aag aac	480
Glu Ser Gly Ala Gln Leu Gly Glu Leu Tyr Tyr Ala Ile Ala Lys Asn	
145 150 155 160	
agc ccc gtg ctc gcg ttc ccg gct ggc gtc tgc ccg tcc atc ggc gtc	528
Ser Pro Val Leu Ala Phe Pro Ala Gly Val Cys Pro Ser Ile Gly Val	
165 170 175	
ggc ggc aac ttc gca ggc ggc ggc ttt ggc atg ctg ctg cgc aag tac	576
Gly Gly Asn Phe Ala Gly Gly Gly Phe Gly Met Leu Leu Arg Lys Tyr	
180 185 190	
ggc atc gcc gct gag aac gtc atc gac gtc aag gtg gtc gac ccc aac	624
Gly Ile Ala Ala Glu Asn Val Ile Asp Val Lys Val Val Asp Pro Asn	
195 200 205	
ggc aag ctg ctc gac aag agc tcc atg agc gcg gac cac ttc tgg gcc	672
Gly Lys Leu Leu Asp Lys Ser Ser Met Ser Ala Asp His Phe Trp Ala	
210 215 220	
gtt agg ggc ggc ggc gga gag agc ttt ggc atc gtc gtc tcg tgg cag	720
Val Arg Gly Gly Gly Gly Glu Ser Phe Gly Ile Val Val Ser Trp Gln	
225 230 235 240	
gtg aag ctc ctg ccg gtg cct ccc acc gtg acc gtg ctc aag atc ccc	768
Val Lys Leu Leu Pro Val Pro Pro Thr Val Thr Val Leu Lys Ile Pro	
245 250 255	
aag acg gtg caa gaa ggc gcc ata gac ctc gtc aac aag tgg cag ctg	816
Lys Thr Val Gln Glu Gly Ala Ile Asp Leu Val Asn Lys Trp Gln Leu	
260 265 270	
gtc ggg ccg gca ctt ccc ggc gac ctc atg atc cgc atc atc ctt gcc	864
Val Gly Pro Ala Leu Pro Gly Asp Leu Met Ile Arg Ile Ile Leu Ala	
275 280 285	
ggg aac agc gcg acg ttc gag gcc atg tac ctg ggc acc tgc agt acc	912
Gly Asn Ser Ala Thr Phe Glu Ala Met Tyr Leu Gly Thr Cys Ser Thr	
290 295 300	
ctg acg ccg ctg atg agc agc aaa ttc ccc gag ctt ggc atg aac ccc	960
Leu Thr Pro Leu Met Ser Ser Lys Phe Pro Glu Leu Gly Met Asn Pro	
305 310 315 320	

tcg cac tgc aac gag atg tcc tgg atc aag tcc atc ccc ttc atc cac	1008
Ser His Cys Asn Glu Met Ser Trp Ile Lys Ser Ile Pro Phe Ile His	
325 330 335	
ctc ggc aag cag aac ctc gac gac ctc ctc aac cgg aac aac acc ttc	1056
Leu Gly Lys Gln Asn Leu Asp Asp Leu Leu Asn Arg Asn Asn Thr Phe	
340 345 350	
aaa cca ttc gcc gaa tac aag tcg gac tac gtg tac cag ccc ttc ccc	1104
Lys Pro Phe Ala Glu Tyr Lys Ser Asp Tyr Val Tyr Gln Pro Phe Pro	
355 360 365	
aag ccc gtg tgg gag cag atc ttc ggc tgg ctt gtg aag ccc ggc gcg	1152
Lys Pro Val Trp Glu Gln Ile Phe Gly Trp Leu Val Lys Pro Gly Ala	
370 375 380	
ggg atc atg atc atg gac ccc tat ggc gcc acc atc agc gct acc ccc	1200
Gly Ile Met Ile Met Asp Pro Tyr Gly Ala Thr Ile Ser Ala Thr Pro	
385 390 395 400	
gaa gcg gcg acg ccg ttc cct cac cgc cag ggc gtc ctc ttc aac atc	1248
Glu Ala Ala Thr Pro Phe Pro His Arg Gln Gly Val Leu Phe Asn Ile	
405 410 415	
cag tac gtc aac tac tgg ttc gct gag tca gcc ggc gcg gcg ccg ctg	1296
Gln Tyr Val Asn Tyr Trp Phe Ala Glu Ser Ala Gly Ala Ala Pro Leu	
420 425 430	
cag tgg agc aag gac ata tac aag ttc atg gag ccg tac gtg agc aaa	1344
Gln Trp Ser Lys Asp Ile Tyr Lys Phe Met Glu Pro Tyr Val Ser Lys	
435 440 445	
aat ccc agg cag gcg tat gcc aac tac agg gac atc gac ctt ggc agg	1392
Asn Pro Arg Gln Ala Tyr Ala Asn Tyr Arg Asp Ile Asp Leu Gly Arg	
450 455 460	
aat gag gtg gtg aac gac atc tcc acc tac agc agc ggc aaa gtg tgg	1440
Asn Glu Val Val Asn Asp Ile Ser Thr Tyr Ser Ser Gly Lys Val Trp	
465 470 475 480	
ggt gag aag tac ttc aag ggc aac ttc caa agg ctc gcc att acc aag	1488
Gly Glu Lys Tyr Phe Lys Gly Asn Phe Gln Arg Leu Ala Ile Thr Lys	
485 490 495	
ggc aag gtg gat cct cag gac tac ttc agg aac gag cag agc atc ccg	1536
Gly Lys Val Asp Pro Gln Asp Tyr Phe Arg Asn Glu Gln Ser Ile Pro	
500 505 510	
cca ctg gtc gag aag tac tga tcgaggacct tgcattggaaa tttagtgct	1587
Pro Leu Val Glu Lys Tyr	
515	
ggttggcggtt tcacat	1603

<210> 2
 <211> 518
 <212> PRT
 <213> Secale cereale

<400> 2

Asn	Tyr	Arg	Ala	Phe	Ala	Leu	Ala	Leu	Leu	Phe	Cys	Ala	Leu	Ser	Cys
1				5					10					15	
Gln	Ala	Ala	Ala	Ala	Ala	Tyr	Ala	Pro	Val	Pro	Ala	Lys	Ala	Asp	Phe
			20					25					30		
Leu	Gly	Cys	Leu	Met	Lys	Glu	Ile	Pro	Ala	Arg	Leu	Leu	Tyr	Ala	Lys
		35					40					45			
Ser	Ser	Pro	Asp	Tyr	Pro	Thr	Val	Leu	Ala	Gln	Thr	Ile	Arg	Asn	Ser
	50					55					60				
Arg	Trp	Ser	Ser	Pro	Gln	Asn	Val	Lys	Pro	Ile	Tyr	Ile	Ile	Thr	Pro
65					70					75					80
Thr	Asn	Ala	Ser	His	Ile	Gln	Ser	Ala	Val	Val	Cys	Gly	Arg	Arg	His
				85					90					95	
Gly	Ile	Arg	Leu	Arg	Val	Arg	Ser	Gly	Gly	His	Asp	Tyr	Glu	Gly	Leu
			100					105					110		
Ser	Tyr	Arg	Ser	Glu	Lys	Pro	Glu	Thr	Phe	Ala	Val	Val	Asp	Leu	Asn
		115					120					125			
Lys	Met	Arg	Ala	Val	Ser	Val	Asp	Gly	Tyr	Ala	Arg	Thr	Ala	Trp	Val
	130					135					140				
Glu	Ser	Gly	Ala	Gln	Leu	Gly	Glu	Leu	Tyr	Tyr	Ala	Ile	Ala	Lys	Asn
145					150					155					160
Ser	Pro	Val	Leu	Ala	Phe	Pro	Ala	Gly	Val	Cys	Pro	Ser	Ile	Gly	Val
				165					170					175	
Gly	Gly	Asn	Phe	Ala	Gly	Gly	Gly	Phe	Gly	Met	Leu	Leu	Arg	Lys	Tyr
			180					185					190		
Gly	Ile	Ala	Ala	Glu	Asn	Val	Ile	Asp	Val	Lys	Val	Val	Asp	Pro	Asn
				195			200					205			
Gly	Lys	Leu	Leu	Asp	Lys	Ser	Ser	Met	Ser	Ala	Asp	His	Phe	Trp	Ala
	210					215					220				
Val	Arg	Gly	Gly	Gly	Gly	Glu	Ser	Phe	Gly	Ile	Val	Val	Ser	Trp	Gln
225					230					235					240
Val	Lys	Leu	Leu	Pro	Val	Pro	Pro	Thr	Val	Thr	Val	Leu	Lys	Ile	Pro
				245					250					255	
Lys	Thr	Val	Gln	Glu	Gly	Ala	Ile	Asp	Leu	Val	Asn	Lys	Trp	Gln	Leu
			260					265					270		

Val Gly Pro Ala Leu Pro Gly Asp Leu Met Ile Arg Ile Ile Leu Ala
 275 280 285
 Gly Asn Ser Ala Thr Phe Glu Ala Met Tyr Leu Gly Thr Cys Ser Thr
 290 295 300
 Leu Thr Pro Leu Met Ser Ser Lys Phe Pro Glu Leu Gly Met Asn Pro
 305 310 315 320
 Ser His Cys Asn Glu Met Ser Trp Ile Lys Ser Ile Pro Phe Ile His
 325 330 335
 Leu Gly Lys Gln Asn Leu Asp Asp Leu Leu Asn Arg Asn Asn Thr Phe
 340 345 350
 Lys Pro Phe Ala Glu Tyr Lys Ser Asp Tyr Val Tyr Gln Pro Phe Pro
 355 360 365
 Lys Pro Val Trp Glu Gln Ile Phe Gly Trp Leu Val Lys Pro Gly Ala
 370 375 380
 Gly Ile Met Ile Met Asp Pro Tyr Gly Ala Thr Ile Ser Ala Thr Pro
 385 390 395 400
 Glu Ala Ala Thr Pro Phe Pro His Arg Gln Gly Val Leu Phe Asn Ile
 405 410 415
 Gln Tyr Val Asn Tyr Trp Phe Ala Glu Ser Ala Gly Ala Ala Pro Leu
 420 425 430
 Gln Trp Ser Lys Asp Ile Tyr Lys Phe Met Glu Pro Tyr Val Ser Lys
 435 440 445
 Asn Pro Arg Gln Ala Tyr Ala Asn Tyr Arg Asp Ile Asp Leu Gly Arg
 450 455 460
 Asn Glu Val Val Asn Asp Ile Ser Thr Tyr Ser Ser Gly Lys Val Trp
 465 470 475 480
 Gly Glu Lys Tyr Phe Lys Gly Asn Phe Gln Arg Leu Ala Ile Thr Lys
 485 490 495
 Gly Lys Val Asp Pro Gln Asp Tyr Phe Arg Asn Glu Gln Ser Ile Pro
 500 505 510
 Pro Leu Val Glu Lys Tyr
 515

<210> 3
 <211> 1644
 <212> DNA
 <213> Secale cereale

<220>
 <221> CDS
 <222> (1) .. (1563)

<400> 3

aac	tcg	agg	gcc	ttt	gct	ctg	gtg	ccc	ctc	ctc	atc	tgc	gtc	ttg	tcc	48
Asn	Ser	Arg	Ala	Phe	Ala	Leu	Val	Pro	Leu	Leu	Ile	Cys	Val	Leu	Ser	
1				5					10					15		
tgc	cac	gcc	gcc	gtc	tcc	tac	gcg	gcg	gcg	ccg	gtg	ccg	gcc	aag	gag	96
Cys	His	Ala	Ala	Val	Ser	Tyr	Ala	Ala	Ala	Pro	Val	Pro	Ala	Lys	Glu	
			20					25					30			
gac	ttc	ttc	gga	tgc	ctg	gtg	aag	gag	ata	ccg	gcc	cgc	ctc	ctc	tac	144
Asp	Phe	Phe	Gly	Cys	Leu	Val	Lys	Glu	Ile	Pro	Ala	Arg	Leu	Leu	Tyr	
		35					40					45				
gcc	aag	agc	tcg	cct	gcc	ttc	ccc	acc	gtc	ctg	gcg	cag	acc	atc	agg	192
Ala	Lys	Ser	Ser	Pro	Ala	Phe	Pro	Thr	Val	Leu	Ala	Gln	Thr	Ile	Arg	
	50					55					60					
aac	tcg	cgg	tgg	tcg	tcg	ccg	cag	agc	gtg	aag	ccg	ctc	tac	atc	atc	240
Asn	Ser	Arg	Trp	Ser	Ser	Pro	Gln	Ser	Val	Lys	Pro	Leu	Tyr	Ile	Ile	
65					70					75					80	
acc	ccc	acc	aac	gcc	tcc	cac	atc	cag	tcc	gcg	gtg	gtg	tgc	ggc	cgc	288
Thr	Pro	Thr	Asn	Ala	Ser	His	Ile	Gln	Ser	Ala	Val	Val	Cys	Gly	Arg	
				85					90					95		
cgg	cac	ggc	gtc	cgc	atc	cgc	gtg	cgg	agc	ggc	ggc	cac	gac	tac	gag	336
Arg	His	Gly	Val	Arg	Ile	Arg	Val	Arg	Ser	Gly	Gly	His	Asp	Tyr	Glu	
			100					105					110			
ggc	ctg	tcg	tac	cgg	tcc	gag	cgc	ccc	gag	gcg	ttc	gcc	gtc	gtc	gac	384
Gly	Leu	Ser	Tyr	Arg	Ser	Glu	Arg	Pro	Glu	Ala	Phe	Ala	Val	Val	Asp	
		115					120					125				
ctc	aac	aag	atg	cgg	gcc	gtg	gtg	gtc	gac	ggc	aag	gct	cgc	acg	gcg	432
Leu	Asn	Lys	Met	Arg	Ala	Val	Val	Val	Asp	Gly	Lys	Ala	Arg	Thr	Ala	
	130					135					140					
tgg	gtg	gac	tcc	ggt	gcg	cag	ctc	ggc	gag	ctc	tac	tac	gcc	atc	gcc	480
Trp	Val	Asp	Ser	Gly	Ala	Gln	Leu	Gly	Glu	Leu	Tyr	Tyr	Ala	Ile	Ala	
145					150					155					160	
aag	aac	agc	ccc	gtg	ctc	gcg	ttc	ccg	gcc	ggc	ggt	tgc	ccg	acc	att	528
Lys	Asn	Ser	Pro	Val	Leu	Ala	Phe	Pro	Ala	Gly	Val	Cys	Pro	Thr	Ile	
				165					170					175		
ggt	gta	ggc	ggc	aac	ttc	gct	ggc	ggc	ggc	ttc	ggc	atg	ctg	ctg	cgc	576
Gly	Val	Gly	Gly	Asn	Phe	Ala	Gly	Gly	Gly	Phe	Gly	Met	Leu	Leu	Arg	
			180					185					190			
aag	tac	ggc	atc	gcc	gcc	gag	aac	gtc	atc	gac	gtg	aag	gtg	gtc	gac	624
Lys	Tyr	Gly	Ile	Ala	Ala	Glu	Asn	Val	Ile	Asp	Val	Lys	Val	Val	Asp	
		195					200					205				
gcc	aac	ggc	aca	ctg	ctc	gac	aag	agc	tcc	atg	agc	gcg	gat	cac	ttc	672
Ala	Asn	Gly	Thr	Leu	Leu	Asp	Lys	Ser	Ser	Met	Ser	Ala	Asp	His	Phe	
	210					215					220					

tgg gcc gtc agg ggc ggc ggc gga gag agc ttc ggc atc gtc gtg tcg Trp Ala Val Arg Gly Gly Gly Gly Glu Ser Phe Gly Ile Val Val Ser 225 230 235 240	720
tgg cag gtg aag ctc ctc ccg gtg cct ccc acc gtg acc gtg ttc aag Trp Gln Val Lys Leu Leu Pro Val Pro Pro Thr Val Thr Val Phe Lys 245 250 255	768
atc ccc aag acg gtg caa gaa ggc gcc gta gag ctc atc aac aag tgg Ile Pro Lys Thr Val Gln Glu Gly Ala Val Glu Leu Ile Asn Lys Trp 260 265 270	816
cag cta gtc gcg ccg gcc ctc ccc gac gac ctg atg atc cgc atc atc Gln Leu Val Ala Pro Ala Leu Pro Asp Asp Leu Met Ile Arg Ile Ile 275 280 285	864
gct ttc ggc ggc acc gcc aag ttc gag gcc atg tac ctg ggc acc tgc Ala Phe Gly Gly Thr Ala Lys Phe Glu Ala Met Tyr Leu Gly Thr Cys 290 295 300	912
aaa gcc ctg aca ccg ctg atg agc agc aga ttc ccc gag ctc ggc atg Lys Ala Leu Thr Pro Leu Met Ser Ser Arg Phe Pro Glu Leu Gly Met 305 310 315 320	960
aac gcc tcg cac tgc aac gag atg ccc tgg atc aag tcc gtc cca ttc Asn Ala Ser His Cys Asn Glu Met Pro Trp Ile Lys Ser Val Pro Phe 325 330 335	1008
atc cac ctt ggc aag cag gcc acc ctc tcc gac ctc ctc aac cgg aac Ile His Leu Gly Lys Gln Ala Thr Leu Ser Asp Leu Leu Asn Arg Asn 340 345 350	1056
aac acc ttc aaa ccc ttc gcc gag tac aag tcg gac tac gtc tac cag Asn Thr Phe Lys Pro Phe Ala Glu Tyr Lys Ser Asp Tyr Val Tyr Gln 355 360 365	1104
ccc gtc ccc aag ccc gtc tgg gcg cag atc ttc gtc tgg ctc gtc aaa Pro Val Pro Lys Pro Val Trp Ala Gln Ile Phe Val Trp Leu Val Lys 370 375 380	1152
ccc ggc gcc ggg atc atg gtc atg gac ccc tac ggc gcc gcc atc agc Pro Gly Ala Gly Ile Met Val Met Asp Pro Tyr Gly Ala Ala Ile Ser 385 390 395 400	1200
gcc acc ccc gaa gcc gcc acg ccg ttc cct cac cgc aag gac gtc ctc Ala Thr Pro Glu Ala Ala Thr Pro Phe Pro His Arg Lys Asp Val Leu 405 410 415	1248
ttc aac atc cag tac gtc aac tac tgg ttc gac gag gca ggc ggc gcc Phe Asn Ile Gln Tyr Val Asn Tyr Trp Phe Asp Glu Ala Gly Gly Ala 420 425 430	1296
gcg ccg ctg cag tgg agc aag gac atg tac agg ttc atg gag ccg tac Ala Pro Leu Gln Trp Ser Lys Asp Met Tyr Arg Phe Met Glu Pro Tyr 435 440 445	1344

gtc agc aag aac ccc aga cag gcc tac gcc aac tac agg gac atc gac 1392
 Val Ser Lys Asn Pro Arg Gln Ala Tyr Ala Asn Tyr Arg Asp Ile Asp
 450 455 460

ctc ggc agg aac gag gtg gtc aac gac atc tcc acc tat gcc agc ggc 1440
 Leu Gly Arg Asn Glu Val Val Asn Asp Ile Ser Thr Tyr Ala Ser Gly
 465 470 475 480

aag gtc tgg ggc gag aag tac ttc aag ggc aac ttc caa agg ctc gcc 1488
 Lys Val Trp Gly Glu Lys Tyr Phe Lys Gly Asn Phe Gln Arg Leu Ala
 485 490 495

att acc aag ggc aag gtg gat cct cag gac tac ttc agg aac gag cag 1536
 Ile Thr Lys Gly Lys Val Asp Pro Gln Asp Tyr Phe Arg Asn Glu Gln
 500 505 510

agc atc ccg ccg ctg cta ggg aag tag tagtactctt gcttgcatgg 1583
 Ser Ile Pro Pro Leu Leu Gly Lys
 515 520

agattttagtag tgcgtcttttc gcgtttcaaaa tgcccaacta gtagaataag gatcgtgcgt 1643

a 1644

<210> 4

<211> 520

<212> PRT

<213> Secale cereale

<400> 4

Asn Ser Arg Ala Phe Ala Leu Val Pro Leu Leu Ile Cys Val Leu Ser
 1 5 10 15

Cys His Ala Ala Val Ser Tyr Ala Ala Ala Pro Val Pro Ala Lys Glu
 20 25 30

Asp Phe Phe Gly Cys Leu Val Lys Glu Ile Pro Ala Arg Leu Leu Tyr
 35 40 45

Ala Lys Ser Ser Pro Ala Phe Pro Thr Val Leu Ala Gln Thr Ile Arg
 50 55 60

Asn Ser Arg Trp Ser Ser Pro Gln Ser Val Lys Pro Leu Tyr Ile Ile
 65 70 75 80

Thr Pro Thr Asn Ala Ser His Ile Gln Ser Ala Val Val Cys Gly Arg
 85 90 95

Arg His Gly Val Arg Ile Arg Val Arg Ser Gly Gly His Asp Tyr Glu
 100 105 110

Gly Leu Ser Tyr Arg Ser Glu Arg Pro Glu Ala Phe Ala Val Val Asp
 115 120 125

Leu Asn Lys Met Arg Ala Val Val Val Asp Gly Lys Ala Arg Thr Ala
 130 135 140

Trp	Val	Asp	Ser	Gly	Ala	Gln	Leu	Gly	Glu	Leu	Tyr	Tyr	Ala	Ile	Ala	145	150	155	160
Lys	Asn	Ser	Pro	Val	Leu	Ala	Phe	Pro	Ala	Gly	Val	Cys	Pro	Thr	Ile	165	170	175	
Gly	Val	Gly	Gly	Asn	Phe	Ala	Gly	Gly	Gly	Phe	Gly	Met	Leu	Leu	Arg	180	185	190	
Lys	Tyr	Gly	Ile	Ala	Ala	Glu	Asn	Val	Ile	Asp	Val	Lys	Val	Val	Asp	195	200	205	
Ala	Asn	Gly	Thr	Leu	Leu	Asp	Lys	Ser	Ser	Met	Ser	Ala	Asp	His	Phe	210	215	220	
Trp	Ala	Val	Arg	Gly	Gly	Gly	Gly	Glu	Ser	Phe	Gly	Ile	Val	Val	Ser	225	230	235	240
Trp	Gln	Val	Lys	Leu	Leu	Pro	Val	Pro	Pro	Thr	Val	Thr	Val	Phe	Lys	245	250	255	
Ile	Pro	Lys	Thr	Val	Gln	Glu	Gly	Ala	Val	Glu	Leu	Ile	Asn	Lys	Trp	260	265	270	
Gln	Leu	Val	Ala	Pro	Ala	Leu	Pro	Asp	Asp	Leu	Met	Ile	Arg	Ile	Ile	275	280	285	
Ala	Phe	Gly	Gly	Thr	Ala	Lys	Phe	Glu	Ala	Met	Tyr	Leu	Gly	Thr	Cys	290	295	300	
Lys	Ala	Leu	Thr	Pro	Leu	Met	Ser	Ser	Arg	Phe	Pro	Glu	Leu	Gly	Met	305	310	315	320
Asn	Ala	Ser	His	Cys	Asn	Glu	Met	Pro	Trp	Ile	Lys	Ser	Val	Pro	Phe	325	330	335	
Ile	His	Leu	Gly	Lys	Gln	Ala	Thr	Leu	Ser	Asp	Leu	Leu	Asn	Arg	Asn	340	345	350	
Asn	Thr	Phe	Lys	Pro	Phe	Ala	Glu	Tyr	Lys	Ser	Asp	Tyr	Val	Tyr	Gln	355	360	365	
Pro	Val	Pro	Lys	Pro	Val	Trp	Ala	Gln	Ile	Phe	Val	Trp	Leu	Val	Lys	370	375	380	
Pro	Gly	Ala	Gly	Ile	Met	Val	Met	Asp	Pro	Tyr	Gly	Ala	Ala	Ile	Ser	385	390	395	400
Ala	Thr	Pro	Glu	Ala	Ala	Thr	Pro	Phe	Pro	His	Arg	Lys	Asp	Val	Leu	405	410	415	
Phe	Asn	Ile	Gln	Tyr	Val	Asn	Tyr	Trp	Phe	Asp	Glu	Ala	Gly	Gly	Ala	420	425	430	
Ala	Pro	Leu	Gln	Trp	Ser	Lys	Asp	Met	Tyr	Arg	Phe	Met	Glu	Pro	Tyr	435	440	445	

Val Ser Lys Asn Pro Arg Gln Ala Tyr Ala Asn Tyr Arg Asp Ile Asp
 450 455 460

Leu Gly Arg Asn Glu Val Val Asn Asp Ile Ser Thr Tyr Ala Ser Gly
 465 470 475 480

Lys Val Trp Gly Glu Lys Tyr Phe Lys Gly Asn Phe Gln Arg Leu Ala
 485 490 495

Ile Thr Lys Gly Lys Val Asp Pro Gln Asp Tyr Phe Arg Asn Glu Gln
 500 505 510

Ser Ile Pro Pro Leu Leu Gly Lys
 515 520

<210> 5
 <211> 1608
 <212> DNA
 <213> Hordeum vulgare

<220>
 <221> CDS
 <222> (1)..(1557)

<400> 5
 agc tcg agg gcc ttc gct ctg gtg ctc ctc ctc tgc gcc ttg tcc tgc 48
 Ser Ser Arg Ala Phe Ala Leu Val Leu Leu Leu Cys Ala Leu Ser Cys
 1 5 10 15

cac cac gct gcc gtc tcc tcc gcg cag gtg ccg gcc aag gac gac ttc 96
 His His Ala Ala Val Ser Ser Ala Gln Val Pro Ala Lys Asp Asp Phe
 20 25 30

ctg gga tgc ctc gtg aag gag ata ccg gcc cgc ctc ctc ttc gcc aag 144
 Leu Gly Cys Leu Val Lys Glu Ile Pro Ala Arg Leu Leu Phe Ala Lys
 35 40 45

agc tcg cct gcc ttc ccc gcc gtc ctg gag cag acc atc agg aac tcg 192
 Ser Ser Pro Ala Phe Pro Ala Val Leu Glu Gln Thr Ile Arg Asn Ser
 50 55 60

cgg tgg tgg tgg ccg cag aac gtg aag ccg ctc tac atc atc acc ccc 240
 Arg Trp Ser Ser Pro Gln Asn Val Lys Pro Leu Tyr Ile Ile Thr Pro
 65 70 75 80

acc aac acc tcc cac atc cag tct gct gtg gtg tgc ggc cgc cgg cac 288
 Thr Asn Thr Ser His Ile Gln Ser Ala Val Val Cys Gly Arg Arg His
 85 90 95

ggc gtc cgc ctc cgc gtg cgg agc ggc ggc cac gac tac gag ggc ctg 336
 Gly Val Arg Leu Arg Val Arg Ser Gly Gly His Asp Tyr Glu Gly Leu
 100 105 110

tcg	tac	cgg	tcc	gag	cgc	ccc	gag	gcg	ttc	gcc	gtc	gta	gac	ctc	aac	384
Ser	Tyr	Arg	Ser	Glu	Arg	Pro	Glu	Ala	Phe	Ala	Val	Val	Asp	Leu	Asn	
		115					120					125				
aag	atg	cgg	acc	gtg	ttg	gtc	aac	gaa	aag	gcc	cgc	acg	gcg	tgg	gtg	432
Lys	Met	Arg	Thr	Val	Leu	Val	Asn	Glu	Lys	Ala	Arg	Thr	Ala	Trp	Val	
	130					135					140					
gac	tcc	ggc	gcg	cag	ctc	ggc	gag	ctc	tac	tac	gcc	atc	gcc	aag	aac	480
Asp	Ser	Gly	Ala	Gln	Leu	Gly	Glu	Leu	Tyr	Tyr	Ala	Ile	Ala	Lys	Asn	
145					150					155					160	
agc	ccc	gtg	ctc	gcg	ttc	cca	gcc	ggc	gtt	tgc	ccg	tcc	att	ggg	gta	528
Ser	Pro	Val	Leu	Ala	Phe	Pro	Ala	Gly	Val	Cys	Pro	Ser	Ile	Gly	Val	
				165					170					175		
ggg	ggc	aac	ttc	gct	ggc	ggc	ggc	ttc	ggc	atg	ctg	ctg	cgc	aag	tac	576
Gly	Gly	Asn	Phe	Ala	Gly	Gly	Gly	Phe	Gly	Met	Leu	Leu	Arg	Lys	Tyr	
		180						185					190			
ggc	atc	gcc	gcc	gag	aac	gtc	atc	gac	gtc	aag	ctg	gtc	gac	gcc	aac	624
Gly	Ile	Ala	Ala	Glu	Asn	Val	Ile	Asp	Val	Lys	Leu	Val	Asp	Ala	Asn	
		195					200					205				
ggc	aag	ctg	ctc	gac	aag	agc	tcc	atg	agc	ccg	gac	cac	ttc	tgg	gcc	672
Gly	Lys	Leu	Leu	Asp	Lys	Ser	Ser	Met	Ser	Pro	Asp	His	Phe	Trp	Ala	
	210					215					220					
gtc	agg	ggc	ggc	ggc	gga	gag	agc	ttc	ggc	atc	gtc	gtc	tcg	tgg	cag	720
Val	Arg	Gly	Gly	Gly	Gly	Glu	Ser	Phe	Gly	Ile	Val	Val	Ser	Trp	Gln	
225					230					235					240	
gtg	aag	ctt	ctc	ccg	gtg	cct	ccc	acc	gtg	act	gtg	ttt	cag	atc	ccc	768
Val	Lys	Leu	Leu	Pro	Val	Pro	Pro	Thr	Val	Thr	Val	Phe	Gln	Ile	Pro	
				245					250					255		
aag	aca	gtg	caa	gaa	ggc	gcc	gta	gac	ctc	atc	aac	aag	tgg	cag	ctg	816
Lys	Thr	Val	Gln	Glu	Gly	Ala	Val	Asp	Leu	Ile	Asn	Lys	Trp	Gln	Leu	
			260					265					270			
gtc	gcg	ccg	gcc	ctt	ccc	ggc	gac	atc	atg	atc	cgc	atc	atc	gcc	atg	864
Val	Ala	Pro	Ala	Leu	Pro	Gly	Asp	Ile	Met	Ile	Arg	Ile	Ile	Ala	Met	
		275					280					285				
ggg	gac	aaa	gcg	acg	ttc	gag	gcc	atg	tac	ctg	ggc	acc	tgc	aaa	acc	912
Gly	Asp	Lys	Ala	Thr	Phe	Glu	Ala	Met	Tyr	Leu	Gly	Thr	Cys	Lys	Thr	
	290					295					300					
ctg	acg	ccg	ctg	atg	agc	agc	aaa	ttc	ccg	gag	ctt	ggc	atg	aac	ccc	960
Leu	Thr	Pro	Leu	Met	Ser	Ser	Lys	Phe	Pro	Glu	Leu	Gly	Met	Asn	Pro	
305					310					315					320	
tcg	cac	tgc	aac	gag	atg	ccc	tgg	atc	aag	tcc	atc	ccc	ttc	atc	cac	1008
Ser	His	Cys	Asn	Glu	Met	Pro	Trp	Ile	Lys	Ser	Ile	Pro	Phe	Ile	His	
				325					330					335		

```

ctt ggc aag cag gcc acc ctg gcc gac ctc ctc aac cgg aac aac acc 1056
Leu Gly Lys Gln Ala Thr Leu Ala Asp Leu Leu Asn Arg Asn Asn Thr
      340                      345                      350

ttc aaa ccc ttc gcc gaa tac aag tcg gac tac gtc tac cag ccc gtc 1104
Phe Lys Pro Phe Ala Glu Tyr Lys Ser Asp Tyr Val Tyr Gln Pro Val
      355                      360                      365

ccc aag ccc gtg tgg gag cag ctc ttc ggc tgg ctc acg aaa ccc ggc 1152
Pro Lys Pro Val Trp Glu Gln Leu Phe Gly Trp Leu Thr Lys Pro Gly
      370                      375                      380

gcg ggg atc atg gtc atg gac cca tac ggc gcc acc atc agc gcc acc 1200
Ala Gly Ile Met Val Met Asp Pro Tyr Gly Ala Thr Ile Ser Ala Thr
      385                      390                      395                      400

ccc gaa gcg gcg acg ccg ttc cct cac cgc aag ggc gtc ctc ttc aac 1248
Pro Glu Ala Ala Thr Pro Phe Pro His Arg Lys Gly Val Leu Phe Asn
      405                      410                      415

atc cag tac gtc aac tac tgg ttc gcc gag gca gcc ggc gcc gcg ccg 1296
Ile Gln Tyr Val Asn Tyr Trp Phe Ala Glu Ala Ala Gly Ala Ala Pro
      420                      425                      430

ctg cag tgg agc aag gac att tac aaa ttc atg gag ccg ttc gtg agc 1344
Leu Gln Trp Ser Lys Asp Ile Tyr Lys Phe Met Glu Pro Phe Val Ser
      435                      440                      445

aag aac ccc agg cag gcg tac gcc aac tac agg gac atc gac ctc ggc 1392
Lys Asn Pro Arg Gln Ala Tyr Ala Asn Tyr Arg Asp Ile Asp Leu Gly
      450                      455                      460

agg aac gag gtg gtg aac gac atc tca acc tac agc agc ggc aag gtg 1440
Arg Asn Glu Val Val Asn Asp Ile Ser Thr Tyr Ser Ser Gly Lys Val
      465                      470                      475                      480

tgg ggc gag aag tac ttc aag ggc aac ttc caa agg ctc gcc atc acc 1488
Trp Gly Glu Lys Tyr Phe Lys Gly Asn Phe Gln Arg Leu Ala Ile Thr
      485                      490                      495

aag ggc aag gtg gat ccc cag gac tac ttc agg aac gag cag agc atc 1536
Lys Gly Lys Val Asp Pro Gln Asp Tyr Phe Arg Asn Glu Gln Ser Ile
      500                      505                      510

ccg ccg ctg ctg ggc aag tag tgaccgagag tcttgcatgg agatttgtag 1587
Pro Pro Leu Leu Gly Lys
      515

tgcgtgcttg gcgtttctga t 1608

```

<210> 6

<211> 518

<212> PRT

<213> Hordeum vulgare

<400> 6

Ser	Ser	Arg	Ala	Phe	Ala	Leu	Val	Leu	Leu	Leu	Cys	Ala	Leu	Ser	Cys
1				5					10					15	
His	His	Ala	Ala	Val	Ser	Ser	Ala	Gln	Val	Pro	Ala	Lys	Asp	Asp	Phe
			20					25					30		
Leu	Gly	Cys	Leu	Val	Lys	Glu	Ile	Pro	Ala	Arg	Leu	Leu	Phe	Ala	Lys
		35					40					45			
Ser	Ser	Pro	Ala	Phe	Pro	Ala	Val	Leu	Glu	Gln	Thr	Ile	Arg	Asn	Ser
	50					55					60				
Arg	Trp	Ser	Ser	Pro	Gln	Asn	Val	Lys	Pro	Leu	Tyr	Ile	Ile	Thr	Pro
65					70					75					80
Thr	Asn	Thr	Ser	His	Ile	Gln	Ser	Ala	Val	Val	Cys	Gly	Arg	Arg	His
				85					90					95	
Gly	Val	Arg	Leu	Arg	Val	Arg	Ser	Gly	Gly	His	Asp	Tyr	Glu	Gly	Leu
			100					105					110		
Ser	Tyr	Arg	Ser	Glu	Arg	Pro	Glu	Ala	Phe	Ala	Val	Val	Asp	Leu	Asn
		115					120					125			
Lys	Met	Arg	Thr	Val	Leu	Val	Asn	Glu	Lys	Ala	Arg	Thr	Ala	Trp	Val
	130					135					140				
Asp	Ser	Gly	Ala	Gln	Leu	Gly	Glu	Leu	Tyr	Tyr	Ala	Ile	Ala	Lys	Asn
145					150					155					160
Ser	Pro	Val	Leu	Ala	Phe	Pro	Ala	Gly	Val	Cys	Pro	Ser	Ile	Gly	Val
				165					170					175	
Gly	Gly	Asn	Phe	Ala	Gly	Gly	Gly	Phe	Gly	Met	Leu	Leu	Arg	Lys	Tyr
			180					185					190		
Gly	Ile	Ala	Ala	Glu	Asn	Val	Ile	Asp	Val	Lys	Leu	Val	Asp	Ala	Asn
		195					200					205			
Gly	Lys	Leu	Leu	Asp	Lys	Ser	Ser	Met	Ser	Pro	Asp	His	Phe	Trp	Ala
	210					215					220				
Val	Arg	Gly	Gly	Gly	Gly	Glu	Ser	Phe	Gly	Ile	Val	Val	Ser	Trp	Gln
225					230					235					240
Val	Lys	Leu	Leu	Pro	Val	Pro	Pro	Thr	Val	Thr	Val	Phe	Gln	Ile	Pro
				245					250					255	
Lys	Thr	Val	Gln	Glu	Gly	Ala	Val	Asp	Leu	Ile	Asn	Lys	Trp	Gln	Leu
			260					265					270		
Val	Ala	Pro	Ala	Leu	Pro	Gly	Asp	Ile	Met	Ile	Arg	Ile	Ile	Ala	Met
		275					280					285			
Gly	Asp	Lys	Ala	Thr	Phe	Glu	Ala	Met	Tyr	Leu	Gly	Thr	Cys	Lys	Thr
	290					295					300				

Leu Thr Pro Leu Met Ser Ser Lys Phe Pro Glu Leu Gly Met Asn Pro
 305 310 315 320
 Ser His Cys Asn Glu Met Pro Trp Ile Lys Ser Ile Pro Phe Ile His
 325 330 335
 Leu Gly Lys Gln Ala Thr Leu Ala Asp Leu Leu Asn Arg Asn Asn Thr
 340 345 350
 Phe Lys Pro Phe Ala Glu Tyr Lys Ser Asp Tyr Val Tyr Gln Pro Val
 355 360 365
 Pro Lys Pro Val Trp Glu Gln Leu Phe Gly Trp Leu Thr Lys Pro Gly
 370 375 380
 Ala Gly Ile Met Val Met Asp Pro Tyr Gly Ala Thr Ile Ser Ala Thr
 385 390 395 400
 Pro Glu Ala Ala Thr Pro Phe Pro His Arg Lys Gly Val Leu Phe Asn
 405 410 415
 Ile Gln Tyr Val Asn Tyr Trp Phe Ala Glu Ala Ala Gly Ala Ala Pro
 420 425 430
 Leu Gln Trp Ser Lys Asp Ile Tyr Lys Phe Met Glu Pro Phe Val Ser
 435 440 445
 Lys Asn Pro Arg Gln Ala Tyr Ala Asn Tyr Arg Asp Ile Asp Leu Gly
 450 455 460
 Arg Asn Glu Val Val Asn Asp Ile Ser Thr Tyr Ser Ser Gly Lys Val
 465 470 475 480
 Trp Gly Glu Lys Tyr Phe Lys Gly Asn Phe Gln Arg Leu Ala Ile Thr
 485 490 495
 Lys Gly Lys Val Asp Pro Gln Asp Tyr Phe Arg Asn Glu Gln Ser Ile
 500 505 510
 Pro Pro Leu Leu Gly Lys
 515

<210> 7
 <211> 1603
 <212> DNA
 <213> Triticum aestivum

<220>
 <221> CDS
 <222> (1)..(1557)

<400> 7
 aac tat agg gcc ttc acg ctg gtg ctc ctc ttc tgc gcc ttg tcc tgt 48
 Asn Tyr Arg Ala Phe Thr Leu Val Leu Leu Phe Cys Ala Leu Ser Cys
 1 5 10 15

caa gcc gcc gcc acc tac gcg ccg gtg cct gcc aag gag gac ttc ctc	96
Gln Ala Ala Ala Thr Tyr Ala Pro Val Pro Ala Lys Glu Asp Phe Leu	
20 25 30	
gga tgc ctc atg aag gag ata ccg gca cgc ctc ctc tac gcc aag agc	144
Gly Cys Leu Met Lys Glu Ile Pro Ala Arg Leu Leu Tyr Ala Lys Ser	
35 40 45	
tcg cct gac ttc ccc acc gtc ctg gcg cag acc atc agg aac tcg cgg	192
Ser Pro Asp Phe Pro Thr Val Leu Ala Gln Thr Ile Arg Asn Ser Arg	
50 55 60	
tgg ttg tcg ccg cag aac gtg aag ccg ctc tac atc atc acc ccc acc	240
Trp Leu Ser Pro Gln Asn Val Lys Pro Leu Tyr Ile Ile Thr Pro Thr	
65 70 75 80	
aac gcc tcg cac atc cag tcc gcg gtg gtg tgc gga cgc cgg cac agc	288
Asn Ala Ser His Ile Gln Ser Ala Val Val Cys Gly Arg Arg His Ser	
85 90 95	
gtc cgc ctc cgc gtc cgg agc ggc ggc cac gac tac gag ggc ctg tcg	336
Val Arg Leu Arg Val Arg Ser Gly Gly His Asp Tyr Glu Gly Leu Ser	
100 105 110	
tac cgg tcc gag aaa ccc gag acg ttc gcc gtc gtc gac ctc aac aag	384
Tyr Arg Ser Glu Lys Pro Glu Thr Phe Ala Val Val Asp Leu Asn Lys	
115 120 125	
atg cgg gca gtg ttg atc gac ggc tac gcc cgc acg gcg tgg gtc gaa	432
Met Arg Ala Val Leu Ile Asp Gly Tyr Ala Arg Thr Ala Trp Val Glu	
130 135 140	
tcc ggc gcg cag ctc ggc gag ctc tac tac gcc atc gcg aaa aac agc	480
Ser Gly Ala Gln Leu Gly Glu Leu Tyr Tyr Ala Ile Ala Lys Asn Ser	
145 150 155 160	
ccc gtg ctc gcg ttc ccg gcc ggc gtc tgc ccg acc atc ggc gtc ggc	528
Pro Val Leu Ala Phe Pro Ala Gly Val Cys Pro Thr Ile Gly Val Gly	
165 170 175	
ggc aac ttc gca ggc ggc ggc ttt ggc atg ctg ctg cgg aag tac ggc	576
Gly Asn Phe Ala Gly Gly Gly Phe Gly Met Leu Leu Arg Lys Tyr Gly	
180 185 190	
atc gcc gcc gag aac gtc atc gac gtc aag gtg gtc gac ccc aac ggc	624
Ile Ala Ala Glu Asn Val Ile Asp Val Lys Val Val Asp Pro Asn Gly	
195 200 205	
aag ctt ctc gac aag agc tcc atg agc ccg gac cac ttc tgg gcc gtc	672
Lys Leu Leu Asp Lys Ser Ser Met Ser Pro Asp His Phe Trp Ala Val	
210 215 220	
agg ggc ggc ggc gga gag agc ttt ggc atc gtc gtg tcg tgg caa gtg	720
Arg Gly Gly Gly Gly Glu Ser Phe Gly Ile Val Val Ser Trp Gln Val	
225 230 235 240	

aag	ctc	ctg	ccg	gtg	cct	ccc	acc	gtg	acc	gtg	ttc	aag	atc	ccc	aag	768
Lys	Leu	Leu	Pro	Val	Pro	Pro	Thr	Val	Thr	Val	Phe	Lys	Ile	Pro	Lys	
				245					250					255		
aca	gtg	caa	gaa	ggc	gcc	gta	gac	ctc	gtc	aac	aag	tgg	caa	ctg	gtc	816
Thr	Val	Gln	Glu	Gly	Ala	Val	Asp	Leu	Val	Asn	Lys	Trp	Gln	Leu	Val	
			260					265					270			
ggg	ccg	gcc	ctt	ccc	ggc	gac	ctc	atg	atc	cgc	gtc	atc	gct	gcg	ggg	864
Gly	Pro	Ala	Leu	Pro	Gly	Asp	Leu	Met	Ile	Arg	Val	Ile	Ala	Ala	Gly	
		275					280					285				
aac	acc	gcg	aca	ttc	gag	ggc	atg	tac	ctg	ggc	acc	tgc	caa	acc	ctg	912
Asn	Thr	Ala	Thr	Phe	Glu	Gly	Met	Tyr	Leu	Gly	Thr	Cys	Gln	Thr	Leu	
	290					295					300					
acg	ccg	ttg	atg	agc	agc	caa	ttc	ccc	gag	ctt	ggc	atg	aac	ccc	tat	960
Thr	Pro	Leu	Met	Ser	Ser	Gln	Phe	Pro	Glu	Leu	Gly	Met	Asn	Pro	Tyr	
305					310					315					320	
cac	tgc	aac	gag	atg	ccc	tgg	atc	aag	tcc	atc	ccc	ttc	atc	cac	ctc	1008
His	Cys	Asn	Glu	Met	Pro	Trp	Ile	Lys	Ser	Ile	Pro	Phe	Ile	His	Leu	
				325					330					335		
ggc	aaa	gag	gcc	agc	ctg	gtc	gac	ctc	ctc	aac	cgg	aac	aac	acc	ttc	1056
Gly	Lys	Glu	Ala	Ser	Leu	Val	Asp	Leu	Leu	Asn	Arg	Asn	Asn	Thr	Phe	
			340					345					350			
aag	ccc	ttc	gcc	gaa	tac	aag	tcg	gac	tac	gtg	tac	cag	ccc	ttc	ccc	1104
Lys	Pro	Phe	Ala	Glu	Tyr	Lys	Ser	Asp	Tyr	Val	Tyr	Gln	Pro	Phe	Pro	
		355					360					365				
aag	ccc	gtg	tgg	gag	cag	atc	ttc	ggc	tgg	ctc	acg	aag	ccc	ggg	ggg	1152
Lys	Pro	Val	Trp	Glu	Gln	Ile	Phe	Gly	Trp	Leu	Thr	Lys	Pro	Gly	Gly	
	370					375					380					
ggg	atg	atg	atc	atg	gac	cca	tac	ggc	gcc	acc	atc	agc	gcc	acc	ccc	1200
Gly	Met	Met	Ile	Met	Asp	Pro	Tyr	Gly	Ala	Thr	Ile	Ser	Ala	Thr	Pro	
385					390					395					400	
gaa	gcg	gcg	acg	ccg	ttc	cct	cac	cgc	cag	ggc	gtt	ctc	ttc	aac	atc	1248
Glu	Ala	Ala	Thr	Pro	Phe	Pro	His	Arg	Gln	Gly	Val	Leu	Phe	Asn	Ile	
				405					410					415		
cag	tac	gtc	aac	tac	tgg	ttc	gcc	gag	gca	gcc	gcc	gcc	gcg	ccg	ctg	1296
Gln	Tyr	Val	Asn	Tyr	Trp	Phe	Ala	Glu	Ala	Ala	Ala	Ala	Ala	Pro	Leu	
			420					425					430			
cag	tgg	agc	aag	gac	atg	tac	aat	ttc	atg	gag	ccg	tac	gtg	agc	aag	1344
Gln	Trp	Ser	Lys	Asp	Met	Tyr	Asn	Phe	Met	Glu	Pro	Tyr	Val	Ser	Lys	
		435					440					445				
aac	ccc	agg	cag	gcg	tac	gcc	aac	tac	agg	gac	att	gac	ctc	ggc	agg	1392
Asn	Pro	Arg	Gln	Ala	Tyr	Ala	Asn	Tyr	Arg	Asp	Ile	Asp	Leu	Gly	Arg	
	450					455					460					

aac gag gtg gtg aac gac atc tca acc tat agc agc ggc aag gtt tgg 1440
 Asn Glu Val Val Asn Asp Ile Ser Thr Tyr Ser Ser Gly Lys Val Trp
 465 470 475 480

ggc gag aag tac ttc aag ggc aac ttc caa agg ctc gct att acc aag 1488
 Gly Glu Lys Tyr Phe Lys Gly Asn Phe Gln Arg Leu Ala Ile Thr Lys
 485 490 495

ggc aag gtg gat cct cag gac tac ttc agg aac gag cag agc atc ccg 1536
 Gly Lys Val Asp Pro Gln Asp Tyr Phe Arg Asn Glu Gln Ser Ile Pro
 500 505 510

ccg ctg ctc gag aag tac tga tcgaggacct tgcattggaga tttagtgcgt 1587
 Pro Leu Leu Glu Lys Tyr
 515

ggttgccggtt tcacat 1603

<210> 8
 <211> 518
 <212> PRT
 <213> Triticum aestivum

<400> 8
 Asn Tyr Arg Ala Phe Thr Leu Val Leu Leu Phe Cys Ala Leu Ser Cys
 1 5 10 15
 Gln Ala Ala Ala Thr Tyr Ala Pro Val Pro Ala Lys Glu Asp Phe Leu
 20 25 30
 Gly Cys Leu Met Lys Glu Ile Pro Ala Arg Leu Leu Tyr Ala Lys Ser
 35 40 45
 Ser Pro Asp Phe Pro Thr Val Leu Ala Gln Thr Ile Arg Asn Ser Arg
 50 55 60
 Trp Leu Ser Pro Gln Asn Val Lys Pro Leu Tyr Ile Ile Thr Pro Thr
 65 70 75 80
 Asn Ala Ser His Ile Gln Ser Ala Val Val Cys Gly Arg Arg His Ser
 85 90 95
 Val Arg Leu Arg Val Arg Ser Gly Gly His Asp Tyr Glu Gly Leu Ser
 100 105 110
 Tyr Arg Ser Glu Lys Pro Glu Thr Phe Ala Val Val Asp Leu Asn Lys
 115 120 125
 Met Arg Ala Val Leu Ile Asp Gly Tyr Ala Arg Thr Ala Trp Val Glu
 130 135 140
 Ser Gly Ala Gln Leu Gly Glu Leu Tyr Tyr Ala Ile Ala Lys Asn Ser
 145 150 155 160
 Pro Val Leu Ala Phe Pro Ala Gly Val Cys Pro Thr Ile Gly Val Gly
 165 170 175

Gly	Asn	Phe	Ala	Gly	Gly	Gly	Phe	Gly	Met	Leu	Leu	Arg	Lys	Tyr	Gly	180	185	190
Ile	Ala	Ala	Glu	Asn	Val	Ile	Asp	Val	Lys	Val	Val	Asp	Pro	Asn	Gly	195	200	205
Lys	Leu	Leu	Asp	Lys	Ser	Ser	Met	Ser	Pro	Asp	His	Phe	Trp	Ala	Val	210	215	220
Arg	Gly	Gly	Gly	Gly	Glu	Ser	Phe	Gly	Ile	Val	Val	Ser	Trp	Gln	Val	225	230	235
Lys	Leu	Leu	Pro	Val	Pro	Pro	Thr	Val	Thr	Val	Phe	Lys	Ile	Pro	Lys	245	250	255
Thr	Val	Gln	Glu	Gly	Ala	Val	Asp	Leu	Val	Asn	Lys	Trp	Gln	Leu	Val	260	265	270
Gly	Pro	Ala	Leu	Pro	Gly	Asp	Leu	Met	Ile	Arg	Val	Ile	Ala	Ala	Gly	275	280	285
Asn	Thr	Ala	Thr	Phe	Glu	Gly	Met	Tyr	Leu	Gly	Thr	Cys	Gln	Thr	Leu	290	295	300
Thr	Pro	Leu	Met	Ser	Ser	Gln	Phe	Pro	Glu	Leu	Gly	Met	Asn	Pro	Tyr	305	310	315
His	Cys	Asn	Glu	Met	Pro	Trp	Ile	Lys	Ser	Ile	Pro	Phe	Ile	His	Leu	325	330	335
Gly	Lys	Glu	Ala	Ser	Leu	Val	Asp	Leu	Leu	Asn	Arg	Asn	Asn	Thr	Phe	340	345	350
Lys	Pro	Phe	Ala	Glu	Tyr	Lys	Ser	Asp	Tyr	Val	Tyr	Gln	Pro	Phe	Pro	355	360	365
Lys	Pro	Val	Trp	Glu	Gln	Ile	Phe	Gly	Trp	Leu	Thr	Lys	Pro	Gly	Gly	370	375	380
Gly	Met	Met	Ile	Met	Asp	Pro	Tyr	Gly	Ala	Thr	Ile	Ser	Ala	Thr	Pro	385	390	395
Glu	Ala	Ala	Thr	Pro	Phe	Pro	His	Arg	Gln	Gly	Val	Leu	Phe	Asn	Ile	405	410	415
Gln	Tyr	Val	Asn	Tyr	Trp	Phe	Ala	Glu	Ala	Ala	Ala	Ala	Ala	Pro	Leu	420	425	430
Gln	Trp	Ser	Lys	Asp	Met	Tyr	Asn	Phe	Met	Glu	Pro	Tyr	Val	Ser	Lys	435	440	445
Asn	Pro	Arg	Gln	Ala	Tyr	Ala	Asn	Tyr	Arg	Asp	Ile	Asp	Leu	Gly	Arg	450	455	460
Asn	Glu	Val	Val	Asn	Asp	Ile	Ser	Thr	Tyr	Ser	Ser	Gly	Lys	Val	Trp	465	470	475
																480		

```
<220>  
<221> CDS  
<222> (1) .. (1557)
```

<400>	9																
aac	tgt	agg	gcc	ttc	gcg	cag	gtg	ctc	ctc	ttc	ttc	gcc	ttg	tcc	tgc		48
Asn	Cys	Arg	Ala	Phe	Ala	Gln	Val	Leu	Leu	Phe	Phe	Ala	Leu	Ser	Cys		
1				5					10					15			
caa	gcc	gcc	gcc	acc	tac	gcg	ccg	gtg	cct	gcc	aag	gag	gac	ttc	ctc		96
Gln	Ala	Ala	Ala	Thr	Tyr	Ala	Pro	Val	Pro	Ala	Lys	Glu	Asp	Phe	Leu		
			20					25					30				
gga	tgc	ctc	atg	aag	gag	ata	ccg	gcc	cgc	ctc	ctc	tac	gcc	aag	agc		144
Gly	Cys	Leu	Met	Lys	Glu	Ile	Pro	Ala	Arg	Leu	Leu	Tyr	Ala	Lys	Ser		
		35					40					45					
tcg	cct	gac	tac	ccc	acc	gtg	ctg	gcg	cag	acc	atc	agg	aac	tcg	cgg		192
Ser	Pro	Asp	Tyr	Pro	Thr	Val	Leu	Ala	Gln	Thr	Ile	Arg	Asn	Ser	Arg		
	50					55					60						
tgg	tcg	acg	cag	cag	aac	gtg	aag	ccg	ctg	tac	atc	atc	acc	ccc	acc		240
Trp	Ser	Thr	Gln	Gln	Asn	Val	Lys	Pro	Leu	Tyr	Ile	Ile	Thr	Pro	Thr		
65					70					75					80		
aac	gcc	tcc	cac	atc	caa	tcc	gcg	gtg	gtg	tgc	ggc	cgc	cgg	cac	ggc		288
Asn	Ala	Ser	His	Ile	Gln	Ser	Ala	Val	Val	Cys	Gly	Arg	Arg	His	Gly		
				85					90					95			
gtc	cgc	ctc	cgc	gtg	cgg	agc	ggc	ggc	cac	gac	tac	gag	ggc	ctg	tcg		336
Val	Arg	Leu	Arg	Val	Arg	Ser	Gly	Gly	His	Asp	Tyr	Glu	Gly	Leu	Ser		
			100					105					110				
tac	cgg	tcc	gag	aaa	ccc	gag	acg	ttc	gcc	gtc	gtc	gac	ctc	aac	aag		384
Tyr	Arg	Ser	Glu	Lys	Pro	Glu	Thr	Phe	Ala	Val	Val	Asp	Leu	Asn	Lys		
		115					120					125					
atg	cgg	gca	gtg	gtt	gtc	gac	ggc	tac	gcc	cgc	acg	gcg	tgg	gtc	gaa		432
Met	Arg	Ala	Val	Val	Val	Asp	Gly	Tyr	Ala	Arg	Thr	Ala	Trp	Val	Glu		
	130					135					140						

tcc ggc gcg cag ctc ggc gag ctc tac tac gcc atc gcg aag aac agc	480
Ser Gly Ala Gln Leu Gly Glu Leu Tyr Tyr Ala Ile Ala Lys Asn Ser	
145 150 155 160	
ccc gtg ctc gcg ttc ccg gcc ggc gtc tgc ccg tcc atc ggc gtc ggc	528
Pro Val Leu Ala Phe Pro Ala Gly Val Cys Pro Ser Ile Gly Val Gly	
165 170 175	
ggc aac ttc gca ggc ggc ggc ttc ggc atg ctg ctg cgc aag tac ggc	576
Gly Asn Phe Ala Gly Gly Gly Phe Gly Met Leu Leu Arg Lys Tyr Gly	
180 185 190	
atc gcc gcc gag aac gtc atc gac gtc aag gtg gtc gac ccc gac ggc	624
Ile Ala Ala Glu Asn Val Ile Asp Val Lys Val Val Asp Pro Asp Gly	
195 200 205	
aag ctg ctc gac aag agc tcc atg agc gcg gac cac ttc tgg gcc gtc	672
Lys Leu Leu Asp Lys Ser Ser Met Ser Ala Asp His Phe Trp Ala Val	
210 215 220	
agg ggc ggc ggc gga gag agc ttc ggc atc gtc gtc tcg tgg cag gtg	720
Arg Gly Gly Gly Gly Glu Ser Phe Gly Ile Val Val Ser Trp Gln Val	
225 230 235 240	
aag ctc atg cca gtg cct ccc acc gtc acc gtg ttt aag atc ccc aag	768
Lys Leu Met Pro Val Pro Pro Thr Val Thr Val Phe Lys Ile Pro Lys	
245 250 255	
acg gtg caa gaa ggc gcc gta gac ctc gtc aac aag tgg cag ctg gtc	816
Thr Val Gln Glu Gly Ala Val Asp Leu Val Asn Lys Trp Gln Leu Val	
260 265 270	
ggg ccg gca ctt ccc ggc gac ctc atg atc cgc gtc atc gct gcc ggg	864
Gly Pro Ala Leu Pro Gly Asp Leu Met Ile Arg Val Ile Ala Ala Gly	
275 280 285	
aac acg gcg acg ttc gag gcc ttg tac ctg ggc acc tgc aaa acc ctg	912
Asn Thr Ala Thr Phe Glu Ala Leu Tyr Leu Gly Thr Cys Lys Thr Leu	
290 295 300	
acg ccg ctg atg agc agc caa ttc ccc gag ctt ggc atg aac ccc tat	960
Thr Pro Leu Met Ser Ser Gln Phe Pro Glu Leu Gly Met Asn Pro Tyr	
305 310 315 320	
cac tgc aac gag atg ccc tgg atc aag tcc gtc ccc ttc atc cac ctc	1008
His Cys Asn Glu Met Pro Trp Ile Lys Ser Val Pro Phe Ile His Leu	
325 330 335	
ggc aaa cag gct ggc ctg gac gac ctc ctc aac cgg aac aac acc ttc	1056
Gly Lys Gln Ala Gly Leu Asp Asp Leu Leu Asn Arg Asn Asn Thr Phe	
340 345 350	
aag ccc ttc gcc gaa tac aag tcg gac tac gtg tac cag ccc ttc ccc	1104
Lys Pro Phe Ala Glu Tyr Lys Ser Asp Tyr Val Tyr Gln Pro Phe Pro	
355 360 365	

```

aag ccc gtg tgg gag cag atc ttc ggc tgg ctc gcg aag ccc ggc gcg 1152
Lys Pro Val Trp Glu Gln Ile Phe Gly Trp Leu Ala Lys Pro Gly Ala
370 375 380

ggg atc atg atc atg gac ccc tac ggc gcc acc atc agc gcc acc ccc 1200
Gly Ile Met Ile Met Asp Pro Tyr Gly Ala Thr Ile Ser Ala Thr Pro
385 390 395 400

gaa gcg gcg acg ccg ttc cct cac cgc cag ggc gtc ctc ttc aac atc 1248
Glu Ala Ala Thr Pro Phe Pro His Arg Gln Gly Val Leu Phe Asn Ile
405 410 415

cag tat gtc aac tac tgg ttc gcc gag cca gcc ggc gcc gcg ccg ctg 1296
Gln Tyr Val Asn Tyr Trp Phe Ala Glu Pro Ala Gly Ala Ala Pro Leu
420 425 430

cag tgg agc aag gac att tac aat ttc atg gag ccg tac gtg agc aag 1344
Gln Trp Ser Lys Asp Ile Tyr Asn Phe Met Glu Pro Tyr Val Ser Lys
435 440 445

aac ccc agg cag gcg tac gcc aac tac agg gac atc gac ctc ggc agg 1392
Asn Pro Arg Gln Ala Tyr Ala Asn Tyr Arg Asp Ile Asp Leu Gly Arg
450 455 460

aat gag gtg gtg aac gac atc tca acc tac agc agc ggc aag gtg tgg 1440
Asn Glu Val Val Asn Asp Ile Ser Thr Tyr Ser Ser Gly Lys Val Trp
465 470 475 480

ggc gag aag tac ttc aag agc aac ttc caa agg ctc gcc att acc aag 1488
Gly Glu Lys Tyr Phe Lys Ser Asn Phe Gln Arg Leu Ala Ile Thr Lys
485 490 495

ggc aag gta gat cct cag gac tac ttc agg aat gag caa agc atc ccg 1536
Gly Lys Val Asp Pro Gln Asp Tyr Phe Arg Asn Glu Gln Ser Ile Pro
500 505 510

ccg ctg atc gag aag tac tga tcgaggacct tgcattggaga tttagtgcgt 1587
Pro Leu Ile Glu Lys Tyr
515

ggttggcgtt tcacat 1603

<210> 10
<211> 518
<212> PRT
<213> Triticum aestivum

<400> 10
Asn Cys Arg Ala Phe Ala Gln Val Leu Leu Phe Phe Ala Leu Ser Cys
1 5 10 15

Gln Ala Ala Ala Thr Tyr Ala Pro Val Pro Ala Lys Glu Asp Phe Leu
20 25 30

Gly Cys Leu Met Lys Glu Ile Pro Ala Arg Leu Leu Tyr Ala Lys Ser
35 40 45

```

Ser	Pro	Asp	Tyr	Pro	Thr	Val	Leu	Ala	Gln	Thr	Ile	Arg	Asn	Ser	Arg	50	55	60	
Trp	Ser	Thr	Gln	Gln	Asn	Val	Lys	Pro	Leu	Tyr	Ile	Ile	Thr	Pro	Thr	65	70	75	80
Asn	Ala	Ser	His	Ile	Gln	Ser	Ala	Val	Val	Cys	Gly	Arg	Arg	His	Gly	85	90	95	
Val	Arg	Leu	Arg	Val	Arg	Ser	Gly	Gly	His	Asp	Tyr	Glu	Gly	Leu	Ser	100	105	110	
Tyr	Arg	Ser	Glu	Lys	Pro	Glu	Thr	Phe	Ala	Val	Val	Asp	Leu	Asn	Lys	115	120	125	
Met	Arg	Ala	Val	Val	Val	Asp	Gly	Tyr	Ala	Arg	Thr	Ala	Trp	Val	Glu	130	135	140	
Ser	Gly	Ala	Gln	Leu	Gly	Glu	Leu	Tyr	Tyr	Ala	Ile	Ala	Lys	Asn	Ser	145	150	155	160
Pro	Val	Leu	Ala	Phe	Pro	Ala	Gly	Val	Cys	Pro	Ser	Ile	Gly	Val	Gly	165	170	175	
Gly	Asn	Phe	Ala	Gly	Gly	Gly	Phe	Gly	Met	Leu	Leu	Arg	Lys	Tyr	Gly	180	185	190	
Ile	Ala	Ala	Glu	Asn	Val	Ile	Asp	Val	Lys	Val	Val	Asp	Pro	Asp	Gly	195	200	205	
Lys	Leu	Leu	Asp	Lys	Ser	Ser	Met	Ser	Ala	Asp	His	Phe	Trp	Ala	Val	210	215	220	
Arg	Gly	Gly	Gly	Gly	Glu	Ser	Phe	Gly	Ile	Val	Val	Ser	Trp	Gln	Val	225	230	235	240
Lys	Leu	Met	Pro	Val	Pro	Pro	Thr	Val	Thr	Val	Phe	Lys	Ile	Pro	Lys	245	250	255	
Thr	Val	Gln	Glu	Gly	Ala	Val	Asp	Leu	Val	Asn	Lys	Trp	Gln	Leu	Val	260	265	270	
Gly	Pro	Ala	Leu	Pro	Gly	Asp	Leu	Met	Ile	Arg	Val	Ile	Ala	Ala	Gly	275	280	285	
Asn	Thr	Ala	Thr	Phe	Glu	Ala	Leu	Tyr	Leu	Gly	Thr	Cys	Lys	Thr	Leu	290	295	300	
Thr	Pro	Leu	Met	Ser	Ser	Gln	Phe	Pro	Glu	Leu	Gly	Met	Asn	Pro	Tyr	305	310	315	320
His	Cys	Asn	Glu	Met	Pro	Trp	Ile	Lys	Ser	Val	Pro	Phe	Ile	His	Leu	325	330	335	
Gly	Lys	Gln	Ala	Gly	Leu	Asp	Asp	Leu	Leu	Asn	Arg	Asn	Asn	Thr	Phe	340	345	350	

Lys Pro Phe Ala Glu Tyr Lys Ser Asp Tyr Val Tyr Gln Pro Phe Pro
 355 360 365
 Lys Pro Val Trp Glu Gln Ile Phe Gly Trp Leu Ala Lys Pro Gly Ala
 370 375 380
 Gly Ile Met Ile Met Asp Pro Tyr Gly Ala Thr Ile Ser Ala Thr Pro
 385 390 395 400
 Glu Ala Ala Thr Pro Phe Pro His Arg Gln Gly Val Leu Phe Asn Ile
 405 410 415
 Gln Tyr Val Asn Tyr Trp Phe Ala Glu Pro Ala Gly Ala Ala Pro Leu
 420 425 430
 Gln Trp Ser Lys Asp Ile Tyr Asn Phe Met Glu Pro Tyr Val Ser Lys
 435 440 445
 Asn Pro Arg Gln Ala Tyr Ala Asn Tyr Arg Asp Ile Asp Leu Gly Arg
 450 455 460
 Asn Glu Val Val Asn Asp Ile Ser Thr Tyr Ser Ser Gly Lys Val Trp
 465 470 475 480
 Gly Glu Lys Tyr Phe Lys Ser Asn Phe Gln Arg Leu Ala Ile Thr Lys
 485 490 495
 Gly Lys Val Asp Pro Gln Asp Tyr Phe Arg Asn Glu Gln Ser Ile Pro
 500 505 510
 Pro Leu Ile Glu Lys Tyr
 515

<210> 11
 <211> 1503
 <212> DNA
 <213> Phleum pratense

<220>
 <221> CDS
 <222> (1)..(1503)

<400> 11
 tac ttc ccg ccg ccg gct gct aaa gaa gac ttc ctg ggt tgc ctg gtt 48
 Tyr Phe Pro Pro Pro Ala Ala Lys Glu Asp Phe Leu Gly Cys Leu Val
 1 5 10 15
 aaa gaa atc ccg ccg cgt ctg ttg tac gcg aaa tcg tcg ccg gcg tat 96
 Lys Glu Ile Pro Pro Arg Leu Leu Tyr Ala Lys Ser Ser Pro Ala Tyr
 20 25 30
 ccc tca gtc ctg ggg cag acc atc cgg aac tcg agg tgg tcg tcg ccg 144
 Pro Ser Val Leu Gly Gln Thr Ile Arg Asn Ser Arg Trp Ser Ser Pro
 35 40 45

gac	aac	gtg	aag	ccg	ctc	tac	atc	atc	acc	ccc	acc	aac	gtc	tcc	cac	192
Asp	Asn	Val	Lys	Pro	Leu	Tyr	Ile	Ile	Thr	Pro	Thr	Asn	Val	Ser	His	
	50					55					60					
atc	cag	tcc	gcc	gtg	gtg	tgc	ggc	cgc	cgc	cac	agc	gtc	cgc	atc	cgc	240
Ile	Gln	Ser	Ala	Val	Val	Cys	Gly	Arg	Arg	His	Ser	Val	Arg	Ile	Arg	
	65				70					75					80	
gtg	cgc	agc	ggc	ggg	cac	gac	tac	gag	ggc	ctc	tgc	tac	cgg	tct	ttg	288
Val	Arg	Ser	Gly	Gly	His	Asp	Tyr	Glu	Gly	Leu	Ser	Tyr	Arg	Ser	Leu	
				85					90					95		
cag	ccc	gag	acg	ttc	gcc	gtc	gtc	gac	ctc	aac	aag	atg	cgg	gcg	gtg	336
Gln	Pro	Glu	Thr	Phe	Ala	Val	Val	Asp	Leu	Asn	Lys	Met	Arg	Ala	Val	
			100					105					110			
tgg	gtg	gac	ggc	aag	gcc	cgc	acg	gcg	tgg	gtg	gac	tcc	ggc	gcg	cag	384
Trp	Val	Asp	Gly	Lys	Ala	Arg	Thr	Ala	Trp	Val	Asp	Ser	Gly	Ala	Gln	
		115					120					125				
ctc	ggc	gag	ctc	tac	tac	gcc	atc	tat	aag	gcg	agc	ccc	acg	ctg	gcg	432
Leu	Gly	Glu	Leu	Tyr	Tyr	Ala	Ile	Tyr	Lys	Ala	Ser	Pro	Thr	Leu	Ala	
	130					135					140					
ttc	ccg	gcc	ggc	gtg	tgc	ccg	acg	atc	gga	gtg	ggc	ggc	aac	ttc	gcg	480
Phe	Pro	Ala	Gly	Val	Cys	Pro	Thr	Ile	Gly	Val	Gly	Gly	Asn	Phe	Ala	
	145				150					155					160	
ggc	ggc	ggc	ttc	ggc	atg	ctg	ctg	cgc	aag	tac	ggc	atc	gcc	gcg	gag	528
Gly	Gly	Gly	Phe	Gly	Met	Leu	Leu	Arg	Lys	Tyr	Gly	Ile	Ala	Ala	Glu	
				165					170					175		
aac	gtc	atc	gac	gtg	aag	ctc	gtc	gac	gcc	aac	ggc	aag	ctg	cac	gac	576
Asn	Val	Ile	Asp	Val	Lys	Leu	Val	Asp	Ala	Asn	Gly	Lys	Leu	His	Asp	
			180					185					190			
aag	aag	tcc	atg	ggc	gac	gac	cat	ttc	tgg	gcc	gtc	agg	ggc	ggc	ggg	624
Lys	Lys	Ser	Met	Gly	Asp	Asp	His	Phe	Trp	Ala	Val	Arg	Gly	Gly	Gly	
		195					200					205				
ggc	gag	agc	ttc	ggc	atc	gtg	gtc	gcg	tgg	cag	gtg	aag	ctc	ctg	ccg	672
Gly	Glu	Ser	Phe	Gly	Ile	Val	Val	Ala	Trp	Gln	Val	Lys	Leu	Leu	Pro	
	210					215					220					
gtg	ccg	ccc	acc	gtg	aca	ata	ttc	aag	atc	tcc	aag	aca	gtg	agc	gag	720
Val	Pro	Pro	Thr	Val	Thr	Ile	Phe	Lys	Ile	Ser	Lys	Thr	Val	Ser	Glu	
	225				230					235					240	
ggc	gcc	gtg	gac	atc	atc	aac	aag	tgg	caa	gtg	gtc	gcg	ccg	cag	ctt	768
Gly	Ala	Val	Asp	Ile	Ile	Asn	Lys	Trp	Gln	Val	Val	Ala	Pro	Gln	Leu	
				245					250					255		
ccc	gcc	gac	ctc	atg	atc	cgc	atc	atc	gcg	cag	ggg	ccc	aag	gcc	acg	816
Pro	Ala	Asp	Leu	Met	Ile	Arg	Ile	Ile	Ala	Gln	Gly	Pro	Lys	Ala	Thr	
			260					265					270			

ttc gag gcc atg tac ctc ggc acc tgc aaa acc ctg acg ccg ttg atg	864
Phe Glu Ala Met Tyr Leu Gly Thr Cys Lys Thr Leu Thr Pro Leu Met	
275 280 285	
agc agc aag ttc ccg gag ctc ggc atg aac ccc tcc cac tgc aac gag	912
Ser Ser Lys Phe Pro Glu Leu Gly Met Asn Pro Ser His Cys Asn Glu	
290 295 300	
atg tca tgg atc cag tcc atc ccc ttc gtc cac ctc ggc cac agg gac	960
Met Ser Trp Ile Gln Ser Ile Pro Phe Val His Leu Gly His Arg Asp	
305 310 315 320	
gcc ctc gag gac gac ctc ctc aac cgg aac aac tcc ttc aag ccc ttc	1008
Ala Leu Glu Asp Asp Leu Leu Asn Arg Asn Asn Ser Phe Lys Pro Phe	
325 330 335	
gcc gaa tac aag tcc gac tac gtc tac cag ccc ttc ccc aag acc gtc	1056
Ala Glu Tyr Lys Ser Asp Tyr Val Tyr Gln Pro Phe Pro Lys Thr Val	
340 345 350	
tgg gag cag atc ctc aac acc tgg ctc gtc aag ccc ggc gcc ggg atc	1104
Trp Glu Gln Ile Leu Asn Thr Trp Leu Val Lys Pro Gly Ala Gly Ile	
355 360 365	
atg atc ttc gac ccc tac ggc gcc acc atc agc gcc acc ccg gag tcc	1152
Met Ile Phe Asp Pro Tyr Gly Ala Thr Ile Ser Ala Thr Pro Glu Ser	
370 375 380	
gcc acg ccc ttc cct cac cgc aag ggc gtc ctc ttc aac atc cag tac	1200
Ala Thr Pro Phe Pro His Arg Lys Gly Val Leu Phe Asn Ile Gln Tyr	
385 390 395 400	
gtc aac tac tgg ttc gcc ccg gga gcc gcc gcc gcc ccc ctc tcg tgg	1248
Val Asn Tyr Trp Phe Ala Pro Gly Ala Ala Ala Ala Pro Leu Ser Trp	
405 410 415	
agc aag gac atc tac aac tac atg gag ccc tac gtg agc aag aac ccc	1296
Ser Lys Asp Ile Tyr Asn Tyr Met Glu Pro Tyr Val Ser Lys Asn Pro	
420 425 430	
agg cag gcg tac gca aac tac agg gac atc gac ctc ggc agg aac gag	1344
Arg Gln Ala Tyr Ala Asn Tyr Arg Asp Ile Asp Leu Gly Arg Asn Glu	
435 440 445	
gtg gtc aac gac gtc tcc acc tac gcc agc ggc aag gtc tgg ggc cag	1392
Val Val Asn Asp Val Ser Thr Tyr Ala Ser Gly Lys Val Trp Gly Gln	
450 455 460	
aaa tac ttc aag ggc aac ttc gag agg ctc gcc att acc aag ggc aag	1440
Lys Tyr Phe Lys Gly Asn Phe Glu Arg Leu Ala Ile Thr Lys Gly Lys	
465 470 475 480	
gtc gat cct acc gac tac ttc agg aac gag cag agc atc ccg ccg ctc	1488
Val Asp Pro Thr Asp Tyr Phe Arg Asn Glu Gln Ser Ile Pro Pro Leu	
485 490 495	

atc aaa aag tac tga
 ile lys lys tyr
 500

1503

<210> 12
 <211> 500
 <212> PRT
 <213> Phleum pratense

<400> 12
 Tyr Phe Pro Pro Pro Ala Ala Lys Glu Asp Phe Leu Gly Cys Leu Val
 1 5 10 15
 Lys Glu Ile Pro Pro Arg Leu Leu Tyr Ala Lys Ser Ser Pro Ala Tyr
 20 25 30
 Pro Ser Val Leu Gly Gln Thr Ile Arg Asn Ser Arg Trp Ser Ser Pro
 35 40 45
 Asp Asn Val Lys Pro Leu Tyr Ile Ile Thr Pro Thr Asn Val Ser His
 50 55 60
 Ile Gln Ser Ala Val Val Cys Gly Arg Arg His Ser Val Arg Ile Arg
 65 70 75 80
 Val Arg Ser Gly Gly His Asp Tyr Glu Gly Leu Ser Tyr Arg Ser Leu
 85 90 95
 Gln Pro Glu Thr Phe Ala Val Val Asp Leu Asn Lys Met Arg Ala Val
 100 105 110
 Trp Val Asp Gly Lys Ala Arg Thr Ala Trp Val Asp Ser Gly Ala Gln
 115 120 125
 Leu Gly Glu Leu Tyr Tyr Ala Ile Tyr Lys Ala Ser Pro Thr Leu Ala
 130 135 140
 Phe Pro Ala Gly Val Cys Pro Thr Ile Gly Val Gly Gly Asn Phe Ala
 145 150 155 160
 Gly Gly Gly Phe Gly Met Leu Leu Arg Lys Tyr Gly Ile Ala Ala Glu
 165 170 175
 Asn Val Ile Asp Val Lys Leu Val Asp Ala Asn Gly Lys Leu His Asp
 180 185 190
 Lys Lys Ser Met Gly Asp Asp His Phe Trp Ala Val Arg Gly Gly Gly
 195 200 205
 Gly Glu Ser Phe Gly Ile Val Val Ala Trp Gln Val Lys Leu Leu Pro
 210 215 220
 Val Pro Pro Thr Val Thr Ile Phe Lys Ile Ser Lys Thr Val Ser Glu
 225 230 235 240
 Gly Ala Val Asp Ile Ile Asn Lys Trp Gln Val Val Ala Pro Gln Leu
 245 250 255

Pro Ala Asp Leu Met Ile Arg Ile Ile Ala Gln Gly Pro Lys Ala Thr
 260 265 270
 Phe Glu Ala Met Tyr Leu Gly Thr Cys Lys Thr Leu Thr Pro Leu Met
 275 280 285
 Ser Ser Lys Phe Pro Glu Leu Gly Met Asn Pro Ser His Cys Asn Glu
 290 295 300
 Met Ser Trp Ile Gln Ser Ile Pro Phe Val His Leu Gly His Arg Asp
 305 310 315 320
 Ala Leu Glu Asp Asp Leu Leu Asn Arg Asn Asn Ser Phe Lys Pro Phe
 325 330 335
 Ala Glu Tyr Lys Ser Asp Tyr Val Tyr Gln Pro Phe Pro Lys Thr Val
 340 345 350
 Trp Glu Gln Ile Leu Asn Thr Trp Leu Val Lys Pro Gly Ala Gly Ile
 355 360 365
 Met Ile Phe Asp Pro Tyr Gly Ala Thr Ile Ser Ala Thr Pro Glu Ser
 370 375 380
 Ala Thr Pro Phe Pro His Arg Lys Gly Val Leu Phe Asn Ile Gln Tyr
 385 390 395 400
 Val Asn Tyr Trp Phe Ala Pro Gly Ala Ala Ala Pro Leu Ser Trp
 405 410 415
 Ser Lys Asp Ile Tyr Asn Tyr Met Glu Pro Tyr Val Ser Lys Asn Pro
 420 425 430
 Arg Gln Ala Tyr Ala Asn Tyr Arg Asp Ile Asp Leu Gly Arg Asn Glu
 435 440 445
 Val Val Asn Asp Val Ser Thr Tyr Ala Ser Gly Lys Val Trp Gly Gln
 450 455 460
 Lys Tyr Phe Lys Gly Asn Phe Glu Arg Leu Ala Ile Thr Lys Gly Lys
 465 470 475 480
 Val Asp Pro Thr Asp Tyr Phe Arg Asn Glu Gln Ser Ile Pro Pro Leu
 485 490 495
 Ile Lys Lys Tyr
 500

<210> 13

<211> 12

<212> PRT

<213> Dactylus glomerata

<400> 13

Asp Ile Tyr Asn Tyr Met Glu Pro Tyr Val Ser Lys
 1 5 10

<210> 14

<211> 11

<212> PRT

<213> Dactylus glomerata

<400> 14

Val Asp Pro Thr Asp Tyr Phe Gly Asn Glu Gln
 1 5 10

<210> 15

<211> 17

<212> PRT

<213> Dactylus glomerata

<400> 15

Ala Arg Thr Ala Trp Val Asp Ser Gly Ala Gln Leu Gly Glu Leu Ser
 1 5 10 15

Tyr

<210> 16

<211> 15

<212> PRT

<213> Dactylus glomerata

<400> 16

Gly Val Leu Phe Asn Ile Gln Tyr Val Asn Tyr Trp Phe Ala Pro
 1 5 10 15

<210> 17

<211> 11

<212> PRT

<213> Cynodon dactylon

<400> 17

Lys Thr Val Lys Pro Leu Tyr Ile Ile Thr Pro
 1 5 10

<210> 18

<211> 22

<212> PRT

<213> Cynodon dactylon

<400> 18

Lys Gln Val Glu Arg Asp Phe Leu Thr Ser Leu Thr Lys Asp Ile Pro
 1 5 10 15

Gln Leu Tyr Leu Lys Ser
20

<210> 19
<211> 16
<212> PRT
<213> Cynodon dactylon

<400> 19
Thr Val Lys Pro Leu Tyr Ile Ile Thr Pro Ile Thr Ala Ala Met Ile
1 5 10 15

<210> 20
<211> 24
<212> PRT
<213> Cynodon dactylon

<400> 20
Leu Arg Lys Tyr Gly Thr Ala Ala Asp Asn Val Ile Asp Ala Lys Val
1 5 10 15

Val Asp Ala Gln Gly Arg Leu Leu
20

<210> 21
<211> 14
<212> PRT
<213> Cynodon dactylon

<400> 21
Lys Trp Gln Thr Val Ala Pro Ala Leu Pro Asp Pro Asn Met
1 5 10

<210> 22
<211> 15
<212> PRT
<213> Cynodon dactylon

<400> 22
Val Thr Trp Ile Glu Ser Val Pro Tyr Ile Pro Met Gly Asp Lys
1 5 10 15

<210> 23
<211> 19
<212> PRT
<213> Cynodon dactylon

<220>
<221> MOD_RES
<222> (8)
<223> variable amino acid

30

<400> 23

Gly Thr Val Arg Asp Leu Leu Xaa Arg Thr Ser Asn Ile Lys Ala Phe
1 5 10 15

Gly Lys Tyr

<210> 24

<211> 23

<212> PRT

<213> Cynodon dactylon

<400> 24

Thr Ser Asn Ile Lys Ala Phe Gly Lys Tyr Lys Ser Asp Tyr Val Leu
1 5 10 15

Glu Pro Ile Pro Lys Lys Ser
20

<210> 25

<211> 13

<212> PRT

<213> Cynodon dactylon

<400> 25

Tyr Arg Asp Leu Asp Leu Gly Val Asn Gln Val Val Gly
1 5 10

<210> 26

<211> 15

<212> PRT

<213> Cynodon dactylon

<400> 26

Ser Ala Thr Pro Pro Thr His Arg Ser Gly Val Leu Phe Asn Ile
1 5 10 15

<210> 27

<211> 36

<212> PRT

<213> Cynodon dactylon

<400> 27

Ala Ala Ala Ala Leu Pro Thr Gln Val Thr Arg Asp Ile Tyr Ala Phe
1 5 10 15

Met Thr Pro Tyr Val Ser Lys Asn Pro Arg Gln Ala Tyr Val Asn Tyr
20 25 30

Arg Asp Leu Asp
35

<210> 28
 <211> 14
 <212> PRT
 <213> Lolium perenne

<400> 28
 Phe Leu Glu Pro Val Leu Gly Leu Ile Phe Pro Ala Gly Val
 1 5 10

<210> 29
 <211> 9
 <212> PRT
 <213> Lolium perenne

<400> 29
 Gly Leu Ile Glu Phe Pro Ala Gly Val
 1 5

<210> 30
 <211> 22
 <212> DNA
 <213> Secale cereale

<400> 30
 ggctcccggg gcgaaccagt ag 22

<210> 31
 <211> 23
 <212> DNA
 <213> Secale cereale

<400> 31
 accaagcct cccacatcca gtc 23

<210> 32
 <211> 49
 <212> DNA
 <213> Secale cereale

<400> 32
 gataagcttc tcgagtgatt agtacttttt gatcagcggc gggatgctc 49

<210> 33
 <211> 23
 <212> DNA
 <213> Secale cereale

<400> 33
 gctctcgatc ggctacaatg gcg 23

<210> 34
 <211> 25
 <212> DNA
 <213> Secale cereale

<400> 34
 cacgcactac aaatctccat gcaag 25

<210> 35
 <211> 30
 <212> DNA
 <213> Secale cereale

<400> 35
 catgcttgat ccttattcta ctagttgggc 30

<210> 36
 <211> 30
 <212> DNA
 <213> Secale cereale

<400> 36
 tacgcacgat ccttattcta ctagttgggc 30

<210> 37
 <211> 30
 <212> DNA
 <213> Hordeum vulgare

<400> 37
 gccttgcct gccaccacgc cgccgccacc 30

<210> 38
 <211> 23
 <212> DNA
 <213> Hordeum vulgare

<400> 38
 gctctcgatc ggctacaatg gcg 23

<210> 39
 <211> 25
 <212> DNA
 <213> Hordeum vulgare

<400> 39
 cacgcactac aaatctccat gcaag 25

<210> 40
 <211> 30
 <212> DNA
 <213> Hordeum vulgare

<400> 40
catgcttgat ccttattcta ctagttgggc

<210> 41
<211> 23
<212> DNA
<213> Triticum aestivum

<400> 41
cacgcactaa atctccatgc aag

23

<210> 42
<211> 30
<212> DNA
<213> Triticum aestivum

<400> 42
tacgcacgat ccttattcta ctagttgggc

30

<210> 43
<211> 23
<212> DNA
<213> Triticum aestivum

<400> 43
aagctctatc gcctacaatg gcg

23

<210> 44
<211> 25
<212> DNA
<213> Triticum aestivum

<400> 44
ggtgctcctc ttctgcgcct tgtcc

25

